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Base pressure control by supersonic micro jets in a suddenly expanded nozzle (Article)

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Abstract

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Experimental studies were conducted in sudden expansion axi-symmetric passage for controlling base pressure and their outputs were showcased in current paper. Micro jet active control techniques are used for controlling base pressure. These controls constitute four spaces around base and symmetric to nozzle axis. Mach numbers of the abruptly expanded flows studied for base pressure range from 1.1 to 2.8 and the obtained wall pressure distribution is depicted for Mach number 1.1, 1.5, 2.1, and 2.8 respectively. In this paper the area ratio of the study was 2.56 and the L/D ratios were up to 1 from 10 respectively. Nozzles working on the concerned inertia level were performed with NPR from 3 to 11. It is found that the active controls through the micro jets are capable of regulating the pressure in the recirculation zone. In the presence of favourable pressure gradient the control becomes effective. An appreciable 65% hike in the pressure at the base was accomplished for the above discussed parameters of the current research. © August 2018 IJENS.

SciVal Topic Prominence

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